

Claims

- [c1] 1. A method for locating an edge (E1 or E2) of a part (P) for acceptance testing of the part using a structured light system comprising:
positioning a diffuse light source (12) in proximity of the part and illuminating the part with light radiating from the source;
rotating the part relative to the light source so light therefrom reflected by the part creates an outline of the part along the edge thereof;
viewing the part with an imaging means (16) to obtain an image of the edge of the part; and,
processing the image to locate the edge of the part in three dimensional space from data produced by analyzing the image.
- [c2] 2. The method of claim 1 wherein the light source (12) is a white light source.
- [c3] 3. The method of claim 2 wherein the imaging means (16) comprises a camera.
- [c4] 4. The method of claim 1 in which analyzing the image to determine the edge of the part includes determining the number of pixels comprising the reflected image viewed by the viewing means as the part is rotated relative to the light source.
- [c5] 5. The method of claim 4 in which analyzing the image includes determining the number of pixels at points along the edge of the part.
- [c6] 6. The method of claim 4 in which the part has more than one edge, and the method is used to locate each edge of the part.
- [c7] 7. The method of claim 4 in which the locations of the edges of the part are used in a co-ordinate system to locate other surface features of the part.
- [c8] 8. A method for locating an edge (E1 or E2) of a part (P) for acceptance testing of the part comprising:
positioning a diffuse, white light source (12) in proximity of the part and illuminating the part with light radiating from the source;
rotating the part relative to the light source so light therefrom reflected by the part creates an outline of the part along the edge thereof;

viewing the part with an imaging means (16) to obtain an image of the edge of the part; and,
processing the image to locate the edge of the part in three dimensional space from data produced by analyzing the image.

- [c9] 9. The method of claim 8 using a structured laser light system (10).
- [c10] 10. The method of claim 8 in which analyzing the image to determine the edge of the part includes determining the number of pixels comprising the reflected image viewed by the viewing means, at the edge thereof, as the part is rotated relative to the light source.
- [c11] 11. The method of claim 10 in which the part has more than one edge, and the method is used to locate each edge of the part.
- [c12] 12. The method of claim 11 in which the locations of the edges of the part are used in a co-ordinate system to locate other surface features of the part.
- [c13] 13. Apparatus (10) for locating an edge (E1 or E2) of a part (P) for acceptance testing of the part comprising:
a diffuse light source (12) positioned in proximity of the part and illuminating the part with a white light radiating from the source;
a support (14) on which the part is mounted, the support being rotatable to move the part relative to the light source so light from the light source reflected off the part creates an outline of the part along the edge thereof;
imaging means (16) viewing the part to obtain an image of the edge of the part; and,
a processor (18) processing the image to locate the edge of the part in three dimensional space from data produced by analyzing the image.
- [c14] 14. The apparatus of claim 13 in which the light source (12) is a source of white light.
- [c15] 15. The apparatus of claim 13 in which the processor (P) analyzes the image of the part to determine the edge of the part by determining the number of pixels comprising the reflected image at the edge thereof as the part is rotated relative

to the light source.

[c16] 16. The apparatus of claim 15 in which the part has more than one edge, and the apparatus locates each edge of the part as it is rotated relative to the light source.

[c17] 17. The apparatus of claim 16 in which the locations of the edges of the part are used in a co-ordinate system to locate other surface features of the part.

[c18] 18. In a structured laser light system for measuring surface features of a part (P) , the improvement comprising:
a diffuse light source (12) positioned in proximity of the part and illuminating the part with a white light radiating from the source;
a support (14) on which the part is mounted, the support being rotatable to move the part relative to the light source so light from the light source reflected off the part creates an outline of the part along an edge (E1, E2) thereof;
a camera (16) viewing the part to obtain an image of the edge of the part; and, a processor (18) processing the image to locate the edge of the part in three dimensional space from data produced by analyzing the image including determining the number of pixels comprising the reflected image at the edge thereof as the part is rotated relative to the light source, and the processor using the location of the edge of the part in a co-ordinate system to locate other surface features of the part for acceptance testing of the part.

[c19] 19. The improvement of claim 18 in which the part has more than one edge, and the system locates each edge of the part as it is rotated relative to the light source.

[c20] 20. The improvement of claim 19 in which the light source (12) is a source of white light.